

tric positioning of FIG. 9, in that at least the full range of diameter difference (i.e., airway-tube bore diameter, less outer diameter of the inserted endotracheal tube) is available for ramp correction of endotracheal-tube projection from the mask.

The mask 65 of FIG. 10 may in all respects be like the mask 40 of FIG. 6, except for a showing of its deflated condition, and except that, instead of the second selectively inflatable system 47, 48 of FIG. 6, the bowl concavity 43' features an integral ramp formation 61, as described in connection with FIGS. 7 and 9. The purpose of FIG. 10 is to demonstrate that upon deflation of the ring 12, the skirt 55 (which provides the safety feature of a pocket to foreclose a misdirected ET from entry into the oesophagus) also serves an important additional purpose, it being noted that even in the fully deflated condition shown, the skirt 55 remains substantially flat across its transverse span.

The additional purpose served by skirt 55 will be recognized from the fact that with careless or inadequately skilled personnel, it can occur that upon insertion of the deflated mask in the patient's throat passage, the distal end of the mask encounters the patient's epiglottis in such manner as to bend the epiglottis downward, thus potentially traumatizing the epiglottis. However, in the course of further insertion of the mask to its intended depth, the downturned epiglottis will smoothly ride the skirt 55, eventually enabling the epiglottis to at least partially enter the bowl concavity, to an extent such that upon a short manipulated retracting displacement of the LMA, the epiglottis will be engaged by the transverse proximal edge of skirt 55 and will be caused to reestablish its normal upwardly directed orientation, within the volume of bowl 43', prior to final distally directed insertional manipulation of the LMA, into its desired position of hypopharynx engagement. At this juncture, the mask will have been correctly positioned, with the epiglottis safely covered by the as-yet unactuated bar 41, and the ring 12 can be inflated, to establish its sealed engagement to the laryngeal inlet.

It will be understood that for all described embodiments of the invention, it is preferred to have ring-12 inflation accompanied by inflation of a back cushion which will serve to provide a mask-stabilizing reference to the back wall of the pharynx, thus enhancing the seal engagement of ring 12 to the laryngeal. Such a back cushion is illustratively described in U.S. Pat. No. 5,355,879, and therefore it is only illustratively and schematically indicated, by phantom profile 39 in FIGS. 5 and 7. FIG. 7 additionally indicates that the thin flexible skirt 55 longitudinally laps distal body features between the laryngeal inlet and the upper sphinctral region 27, so that in conjunction with an inflated back cushion 39 (engaged to the back wall of the pharynx) the skirt 55 will be self-conforming in its adaption to such body features, thus increasing the area of resilient engagement to the laryngeal perimeter and enhancing the effectiveness of sealed engagement of the inflated mask around the laryngeal inlet.

FIG. 11 shows a preferred structural relation between the counterbore of the air inlet of the backing plate and the distal end of the airway tube 14 that is fitted thereto. In particular, airway tube 14 is rigid and therefore not compressible when the proximal end of the mask must be caused to enter the space between teeth of the patient's jaws, and the inlet-airway connection to plate 15 is at a relatively thickly developed proximal region of the elastomeric backing plate. To enable the mask to transiently accommodate passage of the patient's teeth, the underside of the distal end of rigid tube 14 is truncated at 70, suitably at an angle in the range

35° to 45° with respect to the airway-tube axis, the truncation being for at least half of the circumference of the distal end of the airway tube, as shown. Such a truncation enables full reception of the airway tube in the counterbore of the backing plate, as long as the depth of the counterbore is at least equal to the outer diameter of the airway tube, the preferred extent being such that a fully circumferential counterbore lap of the airway tube exists for a depth Δ of at least 20 percent of the counterbore depth, as shown. Such a structural relation will be seen to permit the operator to locally pinch the mask at the region of the counterbore and thus to compress the truncated region against elastomeric material of the mask, with sufficient transient reduction of mask thickness to permit transit of the patient's teeth. In FIG. 11, the profile of the deflated seal ring of the mask appears in heavy phantom outline, to suggest the overall thickness condition to be dealt with in the described squeezing action; the subsequently inflated condition is suggested by light phantom outlines at the proximal and distal ends of the mask.

As an alternative to the locally inflatable device 47 of FIG. 6, FIG. 11 shows use of another ramp structure 71 (shown by dashed outline) built into the bowl of the mask at substantially the longitudinal mid-section of the mask bowl. As with the V-shape of ramp 61 of FIGS. 7, 9 and 10, the transverse profile of ramp structure 71 is also preferably of V-shape, which may provide a more diverting cam action on the advancing distal end of an endotracheal tube, as compared with the epiglottic-elevating action of ramp 61 on the liftable bar 20. The ramps 61 and 71 may be used in tandem, i.e., in longitudinal succession in the bowl of the same laryngeal mask. In both of the ramps 61, 71, the transverse V-shaped profile, wherein the included angle of the V-shape is suitably in the range of 130 to 150 degrees, will be seen to provide a continuing centering action on the emerging ET tube. And since the airway tube 14 (45) of the laryngeal mask is relatively rigid and the backing-plate member 15 is relatively flexible, the described construction enables such manual manipulation of the mask via the airway tube as to enable the distal end of the ET tube to be oriented for a correct entry into the trachea via the glottic opening, even when the mask may have become "kinked" due to an anatomical abnormality.

The described invention will be seen to meet the stated objects. The advancing distal end of an endotracheal tube 29, or other instrumentality, in the course of its guided insertion via the air-supply tube 14 and backing-plate passage 17, will encounter the hinged flap or bar 20 in its at-rest position. This encounter is from an aspect which has an outwardly camming action on bar 20, to deflect in rotation about the effective hinge axis and with such engagement to the epiglottis 30 as to readily fold the epiglottis toward adjacent wall structure of the laryngeal inlet, all within and safely clearing the sealed inflatable ring 12 and skirt 55 of the LMA.

What is claimed is:

1. A laryngeal mask to facilitate ventilation of the lungs of a patient, comprising a generally elliptical ring and means for inflating/deflating the same, mask structure within and peripherally connected to said ring and having a tubular inlet-air connection adapted for externally available ventilation through an aperture in said mask structure, said aperture having an area aligned for direct passage of instrumentation inserted via said tubular inlet-air connection, a longitudinally extending central bar having hinged connection at its upper end to said mask structure via the upper end of said aperture, the hinged connection being such as to position said bar across the center of said aperture in an